

Serial No. 10/715,369

Docket No. HSI-0002

Amdt. dated August 16, 2005

Reply to Office Action of May 16, 2005

Amendments to the Drawings:

The attached drawings include changes to Figs. 1A-2A. These sheets, which include Figs. 1A-2A, replace the original sheets including Figs. 1A-2A. Figures 1A-2A have been amended to correct typographical errors, and to more clearly depict the doping and non-doping layers which form the mission layer. No new matter is added.

Attachment: Replacement Sheets (2)
Annotated Sheets Showing Changes (2)

REMARKS/ARGUMENTS

Claims 1-7 are pending in this application. By this Amendment, the drawings, Abstract, Specification, and claims 1-7 are amended. The drawings, Abstract and Specification are amended for clarification purposes only. No new matter is added. Support for the claims can be found throughout the specification, including the original claims, and the drawings. Withdrawal of the rejections in view of the above amendments and the following remarks is respectfully requested.

Applicants respectfully submit that the amendments to the drawings, Abstract, and specification merely serve to clarify that the emission layer includes both a doping layer and a non-doping layer, as shown in the drawings as filed with the original specification. Thus, the drawings have been amended to include labels which clearly identify the doping and non-doping layers, and the specification has been amended to clarify that the doping and non-doping regions of the electroluminescent layer are doping and non-doping layers as shown in the accompanying drawings. Accordingly, it is respectfully submitted that no new matter is added as a result of these amendments.

The Office Action rejects claims 2-5 under 35 U.S.C. §112, second paragraph as allegedly indefinite. The rejection is respectfully traversed.

Claim 2 (as amended) recites that the doping layer (of the emission layer) has a thickness which is greater than or equal to a thickness of the non-doping layer (of the

emission layer), and not that the thickness of the doping layer is greater than or equal to the thickness of the emission layer, as asserted in the Office Action. Additionally, Applicants respectfully submit that claims 2-5 merely indicate that the doping and non-doping layers of the emission layer are formed such that each layer within the emission layer may contact a different element(s) of the device, thus defining a relative position of the two regions within the emission layer. Accordingly, it is respectfully submitted that claims 2-5 meet the requirements of 35 U.S.C. §112, second paragraph, and thus the rejection should be withdrawn.

The Office Action rejects claims 1, 4, and 6-7 under 35 U.S.C. §102(b) over U.S. Patent No. 6,066,357 to Tang et al. (hereinafter "Tang"). The rejection is respectfully traversed.

Independent claim 1 recites, *inter alia*, wherein the emission layer comprises a doping layer having both host material and doping material, and a non-doping layer having only said host material. Further, independent claim 6 recites, *inter alia*, forming an emission layer that includes a doping layer and a non-doping layer, and independent claim 7 recites, *inter alia*, forming an emission layer that includes a doping layer and a separate non-doping layer. Tang neither discloses nor suggests such features, or the claimed combination.

Tang discloses in Figure 2 a pixel P of an organic light emitting device, including a set (a/b/c) of electrodes 104 positioned on a substrate 102 and covered by a hole transport

layer 110, a light emitting layer 120, an electron transport layer 130, and a row electrode 106. The light emitting layer 120 is divided into three portions within the pixel P, including a red dopant 125, a green dopant 127, and a blue dopant 129, corresponding to the set a/b/c of electrodes 104. This sequence is continuously repeated in adjacent pixels P, with doping material 125, 127, and 129 present throughout the entire light emitting layer 120. Thus, Tang's light emitting layer 120 includes a single layer with dopant dispersed continuously throughout, and Tang neither discloses nor suggests an emission layer including both a doping layer and a non-doping layer as recited in independent claim 1, nor forming an emission layer that includes both a doping layer and a non-doping layer as recited in independent claims 6 and 7. Further, because Tang neither discloses nor suggests the claimed doping and non-doping layers, Tang necessarily neither discloses nor suggests a doping layer having both host material and doping material, and a non-doping layer having only said host material, as recited in independent claim 1. As would be well understood by one of ordinary skill in the art, the presence of the same host material in both the doping and non-doping layers, as recited in independent claim 1, causes the doping layer to provide a hole blocking function, thus precluding the need for a separate hole blocking layer, thus providing a significant advantage over the applied prior art.

Tang discloses another process for forming this device in Figures 10A-10F, in which an undoped light emitting layer 120 is formed over dopant layers 122, 124, and 126 and the

hole transport layer 110 during an interim step of the fabrication process. Application of a fluid vapor 910 diffuses the respective dopants 122, 124, and 126 into the light emitting layer 120 to form the red, green, and blue dopant regions 125, 127, and 129, respectively, discussed above. The device produced by this embodiment of Tang's process is the same as the embodiment shown in Figure 2 of Tang, in that the dopants 125, 127, and 129 are present throughout the entire light emitting layer 120. Figure 10E of Tang, which the Office Action asserts shows a doping region 120 and non-doping regions 122, 124, and 126, is merely an intermediate process step, prior to diffusion of the doping material into the light emitting layer 120 to render it functional, and Tang neither discloses nor suggests an emission layer which includes both a doping layer and a non-doping layer, as recited in independent claims 1, 6, and 7.

For at least these reasons, it is respectfully submitted that independents claim 1, 6, and 7 are not anticipated by Tang, and thus the rejection of independent claims 1, 6, and 7 under 35 U.S.C. §102(b) over Tang should be withdrawn. Dependent claim 4 is allowable at least for the reasons set forth with respect to independent claim 1, from which it depends, as well as for its added features.

The Office Action rejects claims 1-7 under 35 U.S.C. §102(e) over U.S. Patent No. 6,603,140 to Kobori et al. (hereinafter "Kobori"). The rejection is respectfully traversed.

Independent claim 1 recites wherein the emission layer comprises a doping layer having both host material and doping material, and a non-doping layer having only said host material, wherein at least a portion of the non-doping layer is in contact with at least a portion of the doping layer. Further, independent claim 6 recites, *inter alia*, forming an emission layer that includes a doping layer and a non-doping layer, and independent claim 7 recites, *inter alia*, forming an emission layer that includes a doping layer and a separate non-doping layer. Kobori neither discloses nor suggests such features, or the claimed combination.

Kobori discloses an organic EL device in reference example 1, including an anode, a hole injecting layer, and a hole transporting layer formed sequentially on a glass substrate. An electron transporting/light emitting layer is then formed on the hole transporting layer and covered by a cathode. Kobori neither discloses nor suggests in any of the reference examples that the light emitting layer includes a doping layer and a non-doping layer, as recited in independent claims 1, 6, and 7, let alone that a portion of the non-doping layer is in contact with a portion of the doping layer, as recited in independent claim 1. Further, because Kobori neither discloses nor suggests the claimed doping and non-doping layers, Kobori necessarily neither discloses nor suggests a doping layer having both host material and doping material, and a non-doping layer having only said host material, as recited in independent claim 1. As set forth above, the presence of the same host material in both the

doping and non-doping layers precludes the need for a separate hole blocking layer, thus providing a significant advantage over the applied prior art.

The Office Action further refers to claims 7 and 10 of Kobori, indicating that Kobori claims at least two light emitting layers, wherein at least one of the two layers is doped with a dopant. However, even in the claims, Kobori neither discloses nor suggests that one of the light emitting layers includes both a doping layer and a non-doping layer, as recited in independent claims 1, 6, and 7.

Accordingly, it is respectfully submitted that independent claims 1, 6, and 7 are not anticipated by Kobori, and thus the rejection of independent claims 1, 6, and 7 under 35 U.S.C. §102(e) over Kobori should be withdrawn. Dependent claims 2-5 are allowable at least for the reasons set forth with respect to independent claim 1, from which they depend, as well as for their added features.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **JOANNA K. MASON**, at the telephone number listed below.

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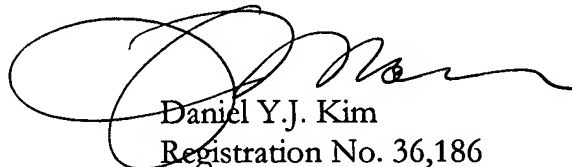
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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
FLESHNER & KIM, LLP



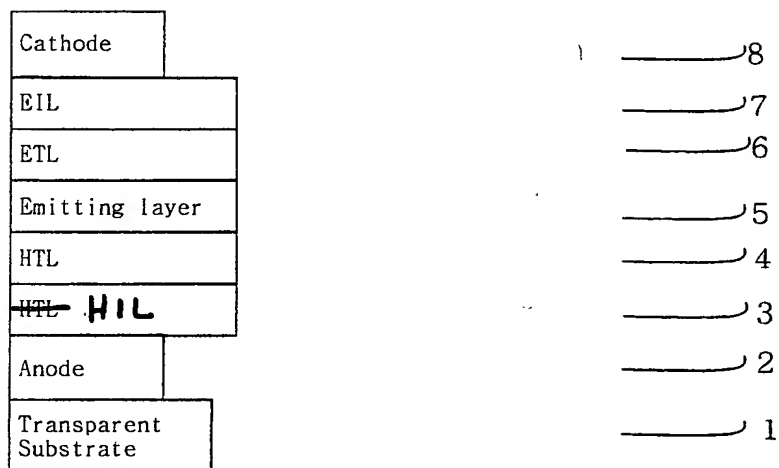
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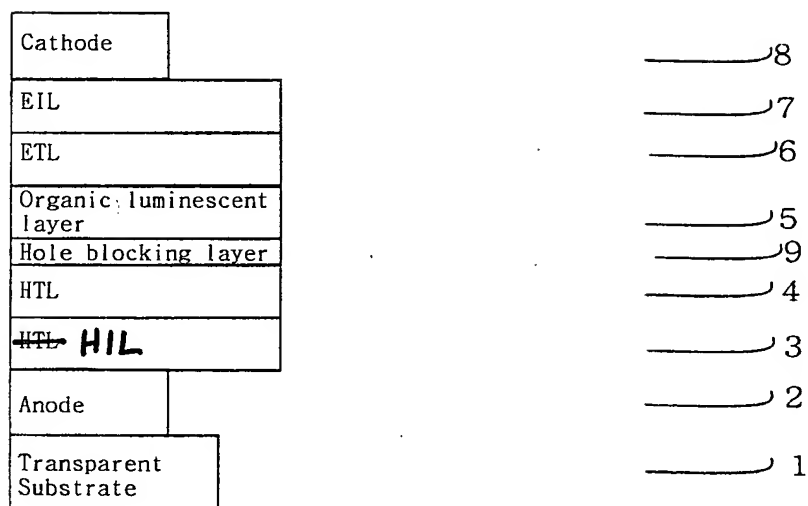
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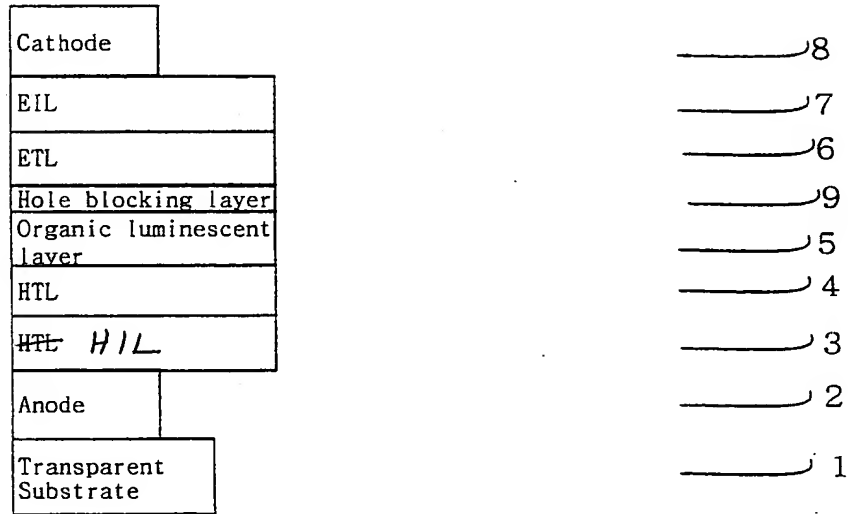
【FIG. 1a】



【FIG. 1b】



【FIG. 1c】



【FIG. 2a】

